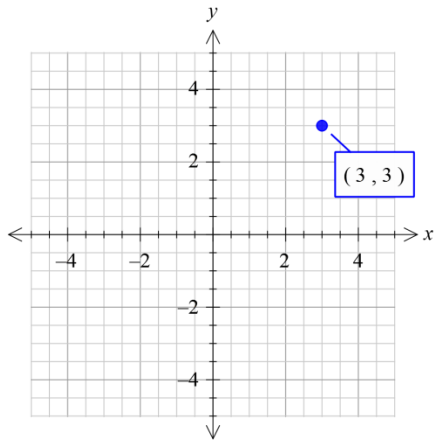


3.24 Polar Equations

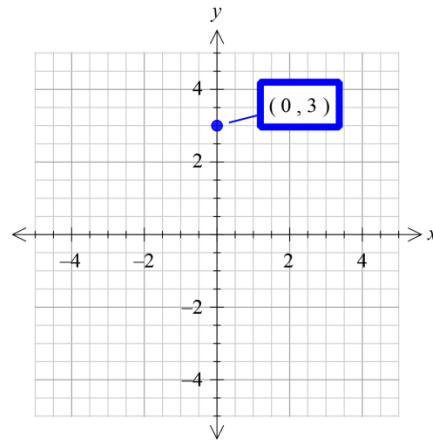
Name _____ Date _____ Period _____

Find polar coordinates for each given point using radian measure for the angle.

1.

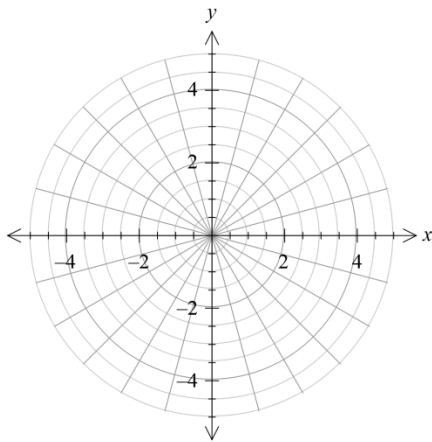


2.

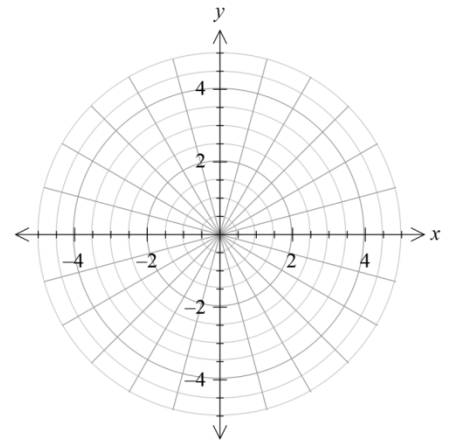


Plot the points whose polar coordinates are given.

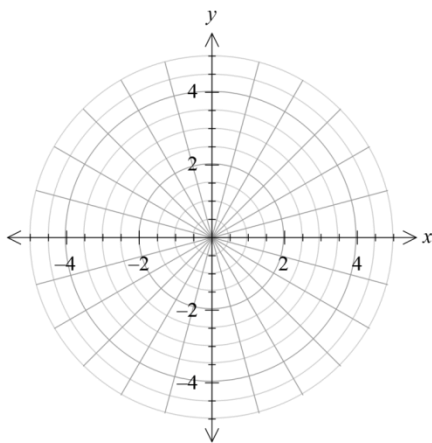
3. $\left(3, \frac{\pi}{6}\right)$



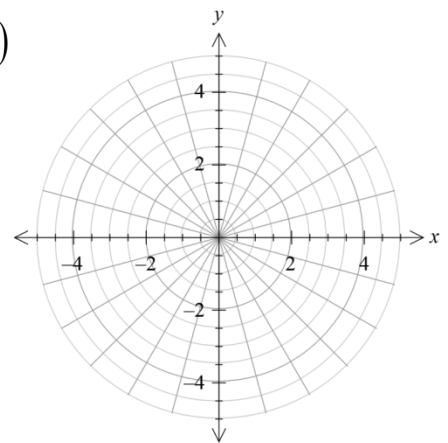
4. $\left(-2, \frac{2\pi}{3}\right)$



5. $\left(2, \frac{-\pi}{4}\right)$



6. $(3, -225^\circ)$



Convert the polar coordinates of each point to rectangular coordinates.

7. $\left(1, \frac{\pi}{6}\right)$

8. $\left(-3, \frac{3\pi}{2}\right)$

9. $(\sqrt{2}, 135^\circ)$

10. $\left(\frac{-\sqrt{2}}{2}, -45^\circ\right)$

Convert the rectangular coordinates of each point to polar coordinates. Use degrees for Θ .

11. $(-2, 2)$

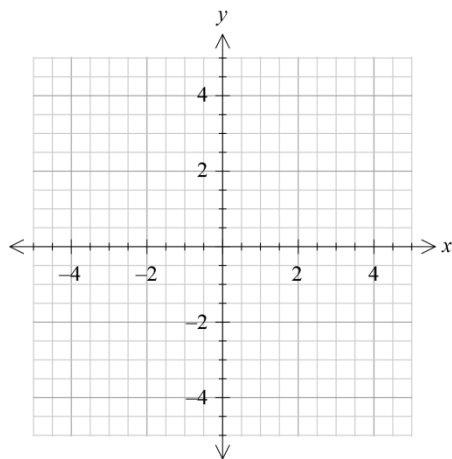
12. $(-2, 2\sqrt{3})$

13. $(0, 2)$

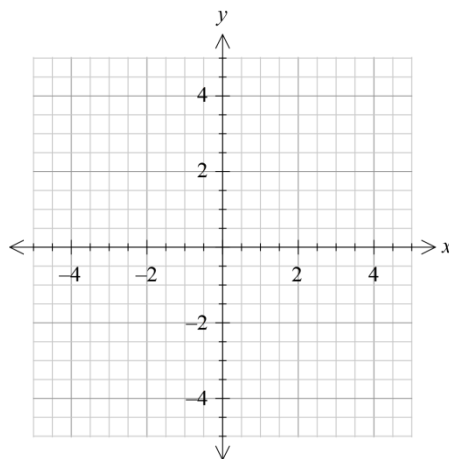
14. $(1, 4)$

Sketch the graph of each polar equation.

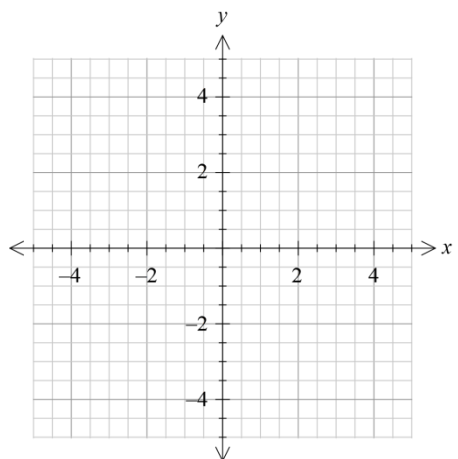
15. $r = 2\sin\theta$



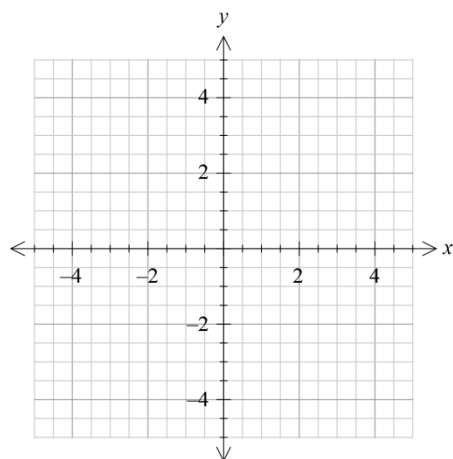
16. $r = 3\cos 2\theta$



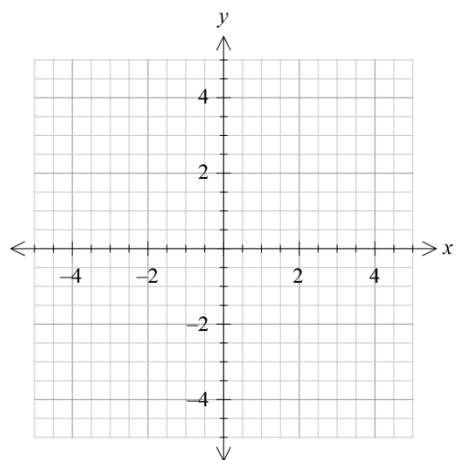
17. $r = 1 + \cos \theta$ (cardioid)



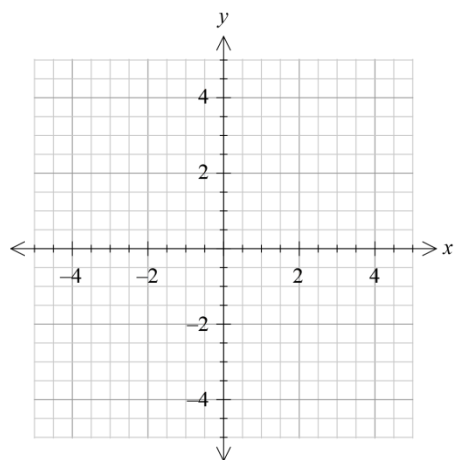
18. $r^2 = 9 \cos 2\theta$ (lemniscate)



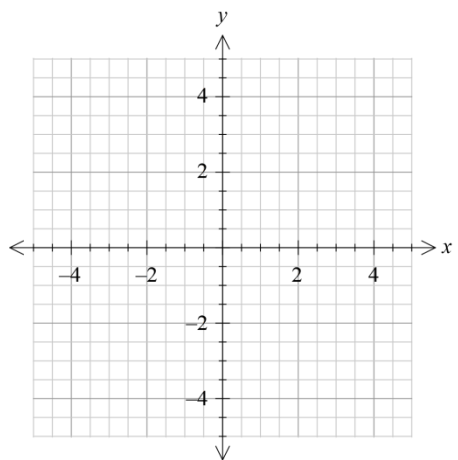
19. $r = 4 \cos 2\theta$ (four-leaf rose)



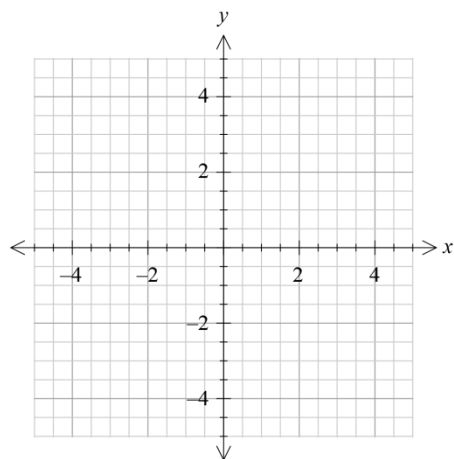
20. $r = 2 \sin 3\theta$ (three-leaf rose)



21. $r = 1 + 2 \cos \theta$ (limacon)



22. $r = 3.5$



For each polar equation, write an equivalent rectangular equation.

23. $r = 4\cos\theta$

24. $r = 5$

25. $\theta = \frac{\pi}{4}$

For each rectangular equation, write an equivalent polar equation.

26. $x = 4$

27. $y = -6$

28. $x^2 + y^2 = 4$

Review

29. Use De Moivre's theorem to simplify $(1+i)^{12}$.

Perform the indicated operations.

30. $(4+3i)^2$

31. $\frac{2+i}{4-i}$

32. $(-3+5i) - (-4-2i)$

33. The force required to push a riding lawnmower up a ramp inclined at 12 degrees is 130 pounds. Find the weight of the riding lawnmower to the nearest pound.